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DISEASES OF THE NERVOUS SYSTEM

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DISEASES of the NERVOUS SYSTEM

(PUBLISHED MONTHLY)

A PRACTICAL JOURNAL ON PSYCHIATRY AND NEUROLOGY

EDITORIAL COMMENT

Tuberculosis in State Mental Hospitals

Statistics reveal the alarmingly high incidence of tuberculosis among patients in mental hospitals. Six and one-half to ten per cent of the total patient population of state hospitals are known to have tuberculosis, and this is the cause of 5 per cent of all deaths among state hospital patients. Unfortunately, the administrative problems concerned with diagnosis, segregation and treatment of such cases were not properly appreciated until recently. In spite of the limited facilities, slender budget and over-crowding which prevail in most present-day state hospitals, the acuteness of this problem has awakened the interest of hospital administrators and the various organizations working to eradicate tuberculosis.

With such handicaps, diagnosis by routine physical examination is impractical. Even if the budget permitted x-ray studies, the inability to segregate the newly admitted "negative" patients may later permit them to show up with tuberculosis. Control of this disease can be achieved only by frequent repeated surveys of the entire patient population, and this, of course, means chest x-rays of all patients at least once, and preferably twice, each year. The budget of most state hospitals would not permit this expenditure. However, with some organization and cooperation between the various hospitals in each state, the problem could be handled with a minimum of expense by making use of Photo-Roentgenography. For instance, the Duplex Photo-Roentgen unit could be mounted on a vehicle that would transport it at regular intervals to the various state hospitals for the annual or semi-annual x-ray studies.

The necessity for segregation of patients with tuberculosis is a vital problem. Some workers have advocated a separate hospital for these patients, but that has many draw-backs. One difficulty among others is the advisability of continuing the therapy of their psychiatric disorder, along with the treatment of tuberculosis. It has always been thought that the mentally ill patient with tuberculosis would not cooperate for treatment, but surprisingly, a large number of them can and do follow treatment programs. Thus the ideal arrangement would be the erection of a separate building at each state hospital for the treatment of their own tuberculous patients.

When this is accomplished—and already definite steps are being taken—a bigger problem is going to be presented. It will be necessary to find physicians who are psychiatrically-minded, who understand tuberculosis, and who will be willing to work for the usual meager assistant physician's salary. In the beginning some adjustment is possible if this physician would be willing to work with the consulting psychiatrist and to accept the advice and assistance of the chest specialist or thoracic surgeon in the community. The availability of a thoracic surgeon is essential to the proper treatment of any large group of patients with tuberculosis.

It was both gratifying and stimulating to hear this problem discussed by the hospital administrators at the last meeting of the American Psychiatric Association, and it is evident that something definite will be accomplished in the near future.

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Psychosis With Huntington's Chorea*

Clinico-pathological Report of a Case

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Rarely does one have the opportunity to study a patient with Huntington's chorea clinically and by encephalography and later to correlate these findings with those demonstrable at necropsy. Stone and Falstein[1] found in the literature from 1841 to 1935, reports on the pathology of only 159 cases of Huntington's chorea and 16 of chronic progressive chorea. It seems worthwhile, therefore, to report a case which we were fortunate enough to be able to study recently.

Huntington's chorea is so called after the American physician, George Huntington, who lived from 1856 to 1916.[2,3,4,5,6,7] This condition is comparatively rare; it is described as familial and hereditary.[3,4,5,6,7,8] Pathologically, it is characterized by extensive degeneration of the nerve parenchyma resulting in atrophy of the cerebral cortex especially in the frontal and temporal lobes; in atrophy of the corpus striatum, involving primarily the caudate nuclei and the putamen; and in hydrocephalus.[1,8,11,12,13] Clinically, the disease is characterized by bizarre, involuntary choreiform movements of a generalized jerking, clownish type.[3,7,13,14,15] It bears no relationship to Sydenham's chorea.[4,5,6,10,17] The movements usually start in the arms and face and later extend to the legs,[3,6,7] and in most cases become progressively worse until death supervenes.[3,8,9,13,17] There is associated a gradual mental deterioration usually ending in dementia;[3,5,7,8,10,13,15,17] in addition, other symptoms of a psychosis usually appear, these often being of the paranoid type.[18,19] The onset is most frequent in the decade from 30 to 40 years[3,4,6,7,8,17] and the duration most frequently from 10 to 20 years.[3,6,7,9] Exceptional cases are said to begin earlier or later in life,[3,5,9,16] and to last considerably longer.[3,5,7] There have been reported also cases with choreiform movements without dementia,[3,6,7] and cases with mental deterioration but without the choreiform movements;[6,7] these atypical forms are apparently rare, however, and the diagnosis of Huntington's chorea can be made in such cases only in the presence of the disease in other members of the family.[7] An affection otherwise identical with Huntington's chorea has been said to occur without any hereditary disposition.[4] Following encephalitis[6,7] and in certain neurosyphilis cases,[6] bizarre choreas simulating Huntington's chorea with mental deterioration have been encountered occasionally in patients who showed neither familial nor hereditary traits. According to one study, 962 cases of Huntington's chorea reported in the United States have been traced to a half dozen common ancestors in the 17th century.[15]

Ordinary treatment is of no avail.[3,5,6,7,10,17] The control of involuntary movements by surgical procedures has received considerable interest in the past few years. The congenital athetoses were first attacked surgically by Horsley after Kinnier Wilson's[20] suggestion that the integrity of the motor cortex was essential in all cases of involuntary movement from diseases of the basal ganglia. This fact has been verified by the surgical cases of Bucy and Buchanan,[21] Sachs[22] and by the clinical case of Patrick and Levy.[23]

Other types of involuntary movement associated with diseases of the basal ganglia, namely Parkinson's disease, epidemic encephalitis, and traumatic encephalopathy,

*Read, with motion pictures, in essentially the same form at the Annual meeting of the Hawaii Territorial Medical Association, Honolulu.

have been successfully treated surgically. This has been done by extirpation of the motor and premotor cortex, areas 4 and 6 of Brodman,[24,25] as well as by interruption of the pyramidal or the extrapyramidal tracts in the spinal cord.[26,27,28,29]

So far as we have been able to ascertain, there has been no case of Huntington's chorea reported in the literature, in which one of the above-named surgical treatments has been instituted in an effort to abolish the involuntary movements. We were in hopes of having an opportunity to do a cortical resection on the patient to be described, but at no time during her hospitalization was her physical condition such that she could have withstood a craniotomy. However, from a physiologic standpoint there is every reason to believe that this type of treatment could be expected to have the same beneficial effect in decreasing or abolishing these incapacitating movements as in other types of involuntary motor activity.

Our patient was committed to the Territorial Hospital June 8, 1939, upon the recommendation of Dr. T. M. Mossman and one of us (R. B. C.). She remained in the hospital until her death March 14, 1941. She was a Caucasian woman, who said she was 44 years old, although her correct age was probably 57. She had been in the Territory over 20 years. She was divorced and childless. She had formerly owned and managed a business of her own, but had been a public charge for some years prior to commitment. She had always drunk a good deal of alcohol. Her past history and family history were otherwise irrelevant except as noted below.

The committing physician (T. M. M.) stated that she had suffered for a number of years from grotesque choreiform movements of her extremities and that several members of her family had allegedly been so afflicted. She had been a patient in the Queen's Hospital as far back as 1933, diagnosed "chorea with psychic changes." The patient herself said that she had had "Saint Vitus' dance" since 1928, and attributed her trouble to a shock occasioned by a surprise party given her at that time. She said that a sister had died from the same disease and that she was going to die of it, too; apparently, this was a delusion, according to a stepsister who denied the existence of the disease in other members of the family. The stepsister gave the date of onset as 1929, and believed the trouble was caused by a fall from a horse about 1922.

The patient was observed in 1925 to be restless, never holding still, constantly twisting a handkerchief in her hands. These mannerisms became gradually worse. In 1928 she became exceedingly jealous and began to fly into rages against her sister but no one else. She complained of frequent headaches.

Commitment was necessitated by the fact that the choreiform movements had become so severe that the patient could no longer care for herself adequately. Her jerkings would cause her to spill food all over the kitchen while she was preparing her meals. She was unable to handle matches in safety. The ordeal of taking a bath and washing her clothing was such that she went about clothed in dirty, tattered garments. Further, her mental condition was such that she refused to be guided by the advice of those who sought to help her. She demanded new clothing when she had a closet full which she said she was saving for formal wear.

On admission to the hospital she was able to walk with assistance, although she was very unsteady on her feet and her arms were tossing about. She was fairly responsive and cooperative at times, although resistive at others. She was much underweight, weighing only 91 pounds for her 63 inches of height. Temperature was 99.6° F., pulse 90, respiration 22. Blood pressure was 130/80.

Physical examination showed many small crusted sores over the body, and numerous discolorations over her buttocks and elsewhere, apparently caused by falls. No other gross abnormalities were found except those of the neurologic condition. There were observed almost continuous bizarre jerking movements of the face, trunk and all extremities, coarse jerks of whole muscle groups and whole extremities rather than of individual muscles. The gait was unsteady and jerking. There was some dysarthria which also was probably dependent on involuntary muscular contractions; she could, however, be understood by those familiar with her. Grimacing was in evidence because of involuntary movements of the facial muscles. There was also some jerking of the tongue which slightly deviated to the left when pro-

truded. The pupils were reported as somewhat sluggish to light, although reacting well in accommodation. Swallowing was unimpaired at that time. Reflexes were generally exaggerated, but no Babinski sign nor clonus were elicited. Sensation was apparently normal to pain and temperature (Figs 1 and 2).

Spinal fluid examination showed 3 cells, negative Ross-Jones and Pandy tests for globulin, negative Wassermann, and mastic 00000. Blood Wassermann and Kahn tests were negative. Urine and stool were normal. Hemoglobin was 80 per cent Talquist. Chest x-ray was so blurred from jerking that it could not be interpreted.

Psychiatric examinations indicated that she was correctly oriented for time, place, and person. Her memory was fairly good for recent events, but not so good for those more remote. Retention, recall, and calculation were fairly good. No hallucinations were observed at that time. She seemed to be considerably worried over her physical condition and reiterated that she was going to die of "Saint Vitus' dance." She persisted in the apparent delusion that a sister had died of the same illness. The patient said that she was glad that she herself had no children who might inherit chorea. She was much concerned as to whether a number of cats she had been raising were being properly cared for. She also worried about some ninety-five dollars which was coming to her from a social agency (correct). She did not believe her mind was abnormal and saw no reason why she should stay in a mental hospital. She was most anxious to get out and sell a few lots so as to get money to start raising chickens and rabbits.

At a staff conference July 3, 1939, a diagnosis of psychosis with Huntington's chorea was made. It was planned to observe further the extent of her incapacity before deciding upon the advisability of surgical treatment as had been proposed.

However, about a week later she developed a fever of 104° F. and the first of many pyogenic infections which were to appear over the trunk, extremities and scalp and to persist more or less during the rest of her life, in spite of diet, vitamins, vaccines, and the like.

A few days after the onset of the fever, she began to entertain delusions of persecution and to show other signs of mental disturbance. She believed that she was being poisoned by the nurse, that her eggnog and cigarettes were poisoned. With clasped hands she implored the attendant not to kill her, stating that she knew her grave had already been prepared. On one occasion she caught the nurse's hand, apologized for all the trouble she had caused, and promised to be as good a patient as possible. During most of this time she was somewhat resistive and was seen to talk to herself a great deal. Urinary incontinence was present, as was difficulty in swallowing, both of which improved along with the general improvement which became manifest by the latter part of August, 1939.

By that time the patient was able to walk

FIGURE 1.

Photograph of patient demonstrating involuntary movements of face and arms. (Reproduction from motion-picture film.)

FIGURE 2.

Photograph of patient showing unsteady gait. (Reproduction from motion-picture film.)

to the solarium alone and spend much of her time there. The involuntary movements had lessened, perhaps in part because of the phenobarbital and hyoscine which was given, and in part because of this new freedom which she was enjoying. It was noticed repeatedly that the jerkings were increased whenever the patient was irritated or frustrated. It was also observed that they disappeared entirely when she was asleep. They were held in abeyance in the hand and arm for a considerable period when she was drinking water, although jerkings of the trunk and the other extremities made drinking and feeding herself a bit difficult. Attempts to comb the hair resulted in wild wavings of the hand, but she finally got the job done. Attempts to touch the nose frequently resulted in getting the finger in the eye, for example. Walking still resulted in many bizarre postures and a most peculiar gait. She could take a tub bath and wash herself, although not without much jerking and flopping about while doing so.

She had by that time begun to answer questions well, and to talk clearly and coherently, to converse with other patients, to read the newspapers and discuss the events of the day, to talk about the impending war in Europe and her brother, who was a soldier, to go to bed voluntarily at appropriate times, and generally to conduct herself in a more or less normal fashion.

Encephalography was performed on October 19, 1939. The patient was given nembutal anesthesia. While under the influence of the drug her involuntary movements were completely abolished. The subarachnoid space was drained, 215 cc. of clear cerebrospinal fluid being obtained. An equal amount of oxygen was injected. The films showed (1) moderate symmetrical internal hydrocephalus; (2) questionable x-ray evidence of a decrease in size of the caudate nucleus bilaterally, more marked on the left; (3) marked localized cortical atrophy of both frontal lobes (Figs. 3 and 4).

Clinically, the patient's condition continued to fail, her infections recurred, emaciation became more marked, speech and swallowing again became more difficult, mental confusion and apparent deterioration progressed. In December, 1939, she fell and cut her head badly, but recovered from that. In June, 1940, she developed pneumonia which was treated with sulfapyridine. Her erythrocyte count fell below two million per cubic centimeter and her hemoglobin to 50 per cent (Kuttner-Leitz), at which time she was given a transfusion. The urine was essentially normal during that illness. Her temperature became normal after about three weeks and she again became stronger for a time. However, her subsequent course was gradually downhill and she died on March 14, 1941.

Autopsy by Dr. D. S. Natsui showed, in addition to the changes in the brain, marked emaciation, multiple healing abscesses and ulcers of the skin, an old pleurisy of the left lung with adhesions to the chest wall, and

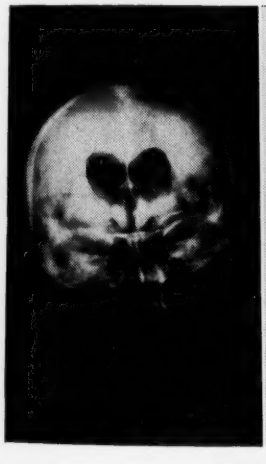

FIGURE 3.

Encephalogram: AP. Internal hydrocephalus with symmetrical decrease in size of caudate nuclei (lateral wall of ventricle). X-ray to right is a normal encephalogram.

FIGURE 4.

Encephalogram: Lateral. Internal hydrocephalus with atrophy of cerebral cortex of frontal lobes.

some marginal atelectasis of that lung. There were also a few areas in the kidney grossly resembling infarcts, but according to Dr. I. L. Tilden, consulting pathologist, microscopically seeming to be due either to pyelonephritis or to embolic abscesses.

Grossly, the brain showed: (1) marked chronic proliferative hyperplastic leptomeningitis; (2) marked generalized cortical atrophy of the cerebral hemispheres; (3) marked localized atrophy of the caudate nucleus and putamen bilaterally; and (4) moderate generalized internal hydrocephalus. The cerebral vascular tree was thin-walled and showed no evidence of calcification nor atheromatous plaques (Fig. 5).

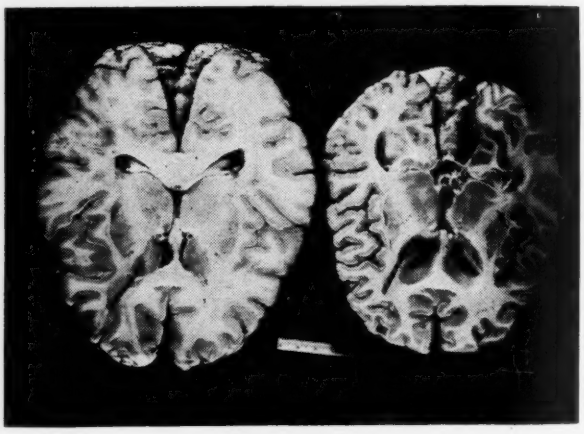

FIGURE 5.
Horizontal section of brain demonstrating the marked atrophy of caudate nuclei with dilatation of ventricles, compared to the normal brain on the right. Note: Size of brain and marked generalized cortical atrophy.

Histopathologic examination of sections of the caudate nucleus showed a very marked degeneration of that structure. Virtually all the ganglion cells were gone, those that remained being mere shadows. In addition, there was seen much round cell infiltration with some satellitosis and neuronophagia.

The pathologic changes in the cerebral cortex of the frontal lobe were not extensive. The large ganglion cells for the most part showed minor change, occasional vacuolization of the cytoplasm and decrease in the Nissl substance. Some cells had swelling of the cytoplasm with chromatin pigment and fat. Infrequently a completely degenerated cell was seen. There appeared to be a generalized increase in the glial elements throughout the subcortical white matter. There were no senile plaques (Figs. 6 and 7).

Summary

A clinico-pathologic study of a case of Huntington's chorea, which was observed over a period of 21 months, is presented.

The patient herself gave an unconfirmed family history of this rare, familial, and hereditary degenerative disease of the basal ganglia and cerebral cortex.

Characteristic bizarre jerking choreiform movements of face, trunk, and all extremities were present.

Mental changes with paranoid delusions and some deterioration were present.

Encephalography revealed generalized atro-

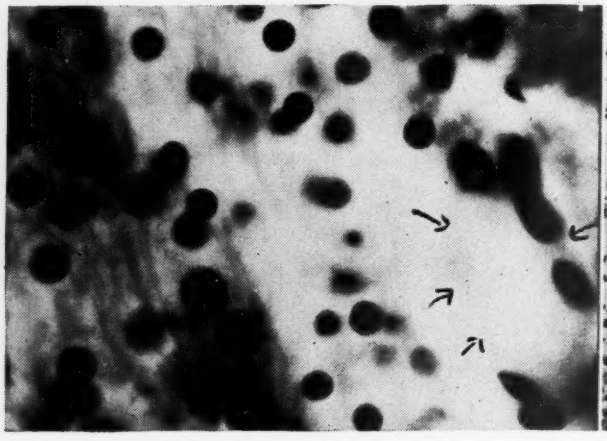

FIGURE 7.
Photomicrography of caudate nucleus showing remains of a ganglion cell (indicated by the arrows) surrounded by swollen astrocytes. (x1000.)

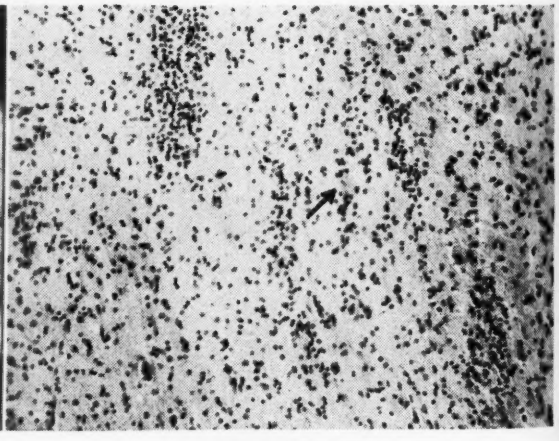

FIGURE 7.
Photomicrograph of caudate nucleus showing absence of ganglion cells, presence of inflammatory cells, and increase inglial elements. Neuronophagia is evidenced (see the arrow) by glial cells surrounding degenerated ganglion cell. (x100.)

phy of the cerebral cortex, bilateral decrease in the size of the caudate nuclei, and moderate internal hydrocephalus. These findings in the brain were verified by autopsy. In addition, the leptomeninges were hyperplastic. There was no evidence of cerebral arteriosclerosis.

Microscopic examination of the caudate nucleus showed an almost complete absence of ganglion cells, the few remaining ones being mere shadows. There was much round-cell infiltration, with some satellitosis and neuronophagia.

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Clinical Implications of Psychosomatic Medicine*

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During the past two decades, medical literature has become increasingly occupied with consideration of the causative role of emotional factors in organic disease. The human being involves a totality in which the soma, i.e., the organs and systems, are brought into harmonious functioning, embracing their inner relationships with the outside world by the participation of the mind, or psyche, in a balancing process. This permits the organism to be a coordinated unit. Cannon has pointed out that in order to discover early signs of defect, reliable measures of physiological technique are needed. Critical tests must be devised which will reveal the ability of the organism to withstand stresses, particularly during the different physiological and psychological epochs evolving through the years. Criteria for judging the degree of perfection of the protective and corrective devices of our bodily economy must be established.

The powerful influence which emotional states can exert on body functions needs no proof. Neuropathological study itself may reveal little as to disturbed function, yet emotional upsets which leave in the nervous pathways no visible trace, have concrete and obvious effects, and may be the cause of profound misery and suffering. The knowledge we have of the physiological responses of the organism as a result of varying emotions, such as obsessional fears which may disturb or interrupt digestion or cause heart palpitation—or anger which sends the blood pressure oscillating upwardly and alters carbohydrate metabolism, and the application of these considerations to certain morbid processes of the body, have led to a new chapter of medicine, namely, "psychosomatic medicine." Too often the patient, not finding understanding, will take his troubles to cultists who are attentive and who confidently promise aid, giving further evidence that such complaints of the psychoneurotic sufferer should not be disregarded. The term "psychosomatic" is descriptive, according to Flanders Dunbar, rather of the observer in his endeavor to comprehend, than of the organismal unit observed. "Psycho" and "somatic" represent merely two different angles of observation. If there is any dichotomy inherent in the term "psychosomatic," it is a projected one not inherent in the organism observed, but in the mind of the observer and his method of observation. According to Dunbar, who has written extensively on this subject, our best aid to understand disease processes is a picture taken from these two angles, viewed simultaneously, i.e., united stereoptically. However, if we understand psychic phenomena, or only the subjective manifestations or perceptions of certain body processes, this dichotomy disappears. Internist and psychiatrist alike need a more ready method of estimating the relative importance of psychic and somatic aspects of an illness as a basis for therapy.

National mortality and morbidity statistics show clearly that nearly half of all those ill in the United States today are suffering from chronic illness, and that major mortality is occasioned by cardio-vascular diseases, and accidents. In spite of the knowledge that cardio-vascular diseases, nervous or mental diseases (exclusive of insanity) and accidents have increased our mortality and morbidity lists in the course of years, these are the diseases in which we have made the least progress by way of prevention or cure. We have failed to observe that these are the illnesses in which the emotional factor is of the greatest de-

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terminative importance. They are illnesses characterized by changes in secretion, muscular tension, and circulation, which Cannon and others have demonstrated are the physiological changes most clearly related to emotion. Research workers and clinicians in the field of so-called organic illnesses are handicapped by distortions produced by psychic factors, which heretofore could not be measured or estimated. Basal metabolism, blood chemistry, blood counts, blood pressure, pulse, temperature, etc., are altered by the psychic component of illness, often sufficiently to become seriously misleading, invalidating, or self-contradictory. Operations that seemed both indicated and exigent in terms of such tests, on clinical study may be rendered unnecessary by treatment of the psychic component in the illness. Another oversight often encountered is that physical symptoms often replace psychic symptomatology, so that as one increases, the other decreases. Patients with serious physical illness are likely to appear "normal" and psychically, to thinking themselves so.

However, if the first physical symptoms are relieved or removed, without giving consideration to underlying emotional factors, such patients often show marked symptoms of neurosis, or have new illness or accident. On the other hand, in psychotic patients aggravation of organic damage is ofted followed by dimunition of psychic symptomatology. Since organic and emotional states are bound together, both depending upon characteristics specific for each individual, and upon all stimuli coming from the external world, the patient must be treated as a whole. However, this does not relieve us of the responsibility for scientific approach—and an attempt to develop a methodology as precise as are those we have developed for treatment of parts of the whole.

Frequent observation has shown that after lower abdominal operations in women, many psychiatric disorders may occur from one to four weeks subsequent to surgical procedure. Many of these reactions are characterized by a peculiar type of depression, often there are obsessional ideas, or compulsive trends. These fundamental psychiatric disorders were existent for some time prior to the operation. However, they are difficult to evaluate satisfactorily, because by the time the patient is hospitalized, she has been given by implication a tentative diagnosis, and is resigned to, or initially able to accept therapy directed at her soma. With this in mind, she enters the hospital with a sense of security and hope, and with temporary amelioration in the disorder of mood, she feels better. Because of being away from home, the operation itself, sedation, dependency on nursing care, etc., there is often a temporary modification of the affective-regulatory functions. During the convalescent period her personality disorder has been subordinated temporarily. With convalescence ending, the patient is expected, both by herself and others, to resume responsibility and to take her regular place in life. Thereupon, she is less apt to feel secure, and her original symptoms may return, which previously had fulfilled their original unconscious purpose. In addition, she may have fewer functions with which to affect an adjustment, so that not infrequently the operative and hospital experience beclouds the patient's discriminative memory for the preoperative problems, thereby making it difficult for the physician to elicit the true facts.

It was thought that by careful review of a large series of cases studied intensively from all points of view that an evaluation of the psychosomatic element of disease could be made effectively. The diagnostic-service at Harper Hospital has been set up for such intensive study, since these patients are referred by physicians when there seems to be a diagnostic problem. Such cases, studied carefully in clinic and laboratory, are further investigated by calling in consultants from each field concerned. Such a series of cases, naturally, would present in all probability a higher incidence of psychosomatic defect than cases selected at random from general practice. The chief-of-staff reviews each case in detail, and sends a summary to the referring physician with all recommendations for therapy made by the various consultants. Therefore, a study of such cases should avoid the possible limitation of one examiner's point of view, and would provide, instead, the opportunity to evaluate the patient's condition from every specialty, including results of examination by internist, roentgenologist, endocrinologist, ophthalmologist, psychiatrist, neurologist, etc.

The review of the last 300 consecutive cases

studied in this diagnostic-service revealed a number of interesting clinical observations and possibilities, which were tabulated, and which are summarized as follows:

A majority of cases fell between the second and fourth decades, the largest number being in the third decade. There were 171 female patients, contrasted with 129 male; 230 were married, 62 were single. Patients who admitted divorce were recorded at 8. This figure undoubtedly is not accurate, since it does not represent the actual percentage of divorces in general. Many probably had been divorced but did not admit this in giving their histories. The cases were classified in terms of disturbances of the "soma," that is to say, those included under the various systems of classifications were arbitrarily chosen from the organic structure involved. For example, in the gastro-intestinal category, all cases diagnosed by soma, from let us say, stomatitis to hemorrhoids, were classified together. If the secondary, or complicating diagnosis included a similar organic symptom or structure which had been listed under the primary diagnosis, such was not recorded; i.e., if a patient had as a primary diagnosis "pyelonephritis" and if he suffered from a complicating or secondary condition of cystitis, the second diagnosis was not listed; but, if in addition he suffered from an orthopedic condition or pulmonary disturbance, such a second diagnosis would be included. In this way, the three hundred cases have been broken up into categories of somatic disturbance. In the secondary or complicating diagnosis there is no repetition of the soma involved in the primary diagnosis, unless a new soma or organ-system was involved.

It will be seen from the chart that 66 patients had disturbances of the gastro-intestinal tract included in the primary diagnosis, while there were 53 primary psychiatric diagnoses, most of which were psychoneuroses and anxiety states. In the secondary or complicating diagnosis, there were 58 psychiatric diagnoses, making a total of 111 out of 300 which were considered either primarily or secondarily psychiatric. In reviewing the charts, it was found that whenever there was even the slightest organic or structural defect, such was given preference in the primary diagnosis. In many cases where the functional diagnosis was considered to be the

CLINICAL SUMMARY OF 300 CONSECUTIVE DIAGNOSTIC CLINIC CASES STUDIED AT HARPER HOSPITAL, NOVEMBER, 1939, TO OCTOBER, 1941

Age	Decades	10-20		21-30		31-40		41-50		51-60		60 Plus	
	No. of Cases	14		57		87		58		48		36	
Sex		*Male* 129		*Female* 171									
Marital Status		*Single* 63		*Married* 230		*Admitted Divorce* 8							
		G.I.T.	*Psychiatric*	*C.R.& Circ.*	*N.M.incl. Neuro& N.Surg.*	*Metab.& Endocrin.*	*G.U.*	*Ortho*	*E.N.T.*	*Derm.*	*Hemat.*	*Eye*	*Dental*
Primary Diagnosis		66	53	47	33	33	28	15	11	6	4	4	0
Secondary and Complicating Diagnosis		24	58	16	11	36	14	8	15	2	1	2	7

Number of Cases in Which Specific Recommendation of Some Form of Psychotherapy Be Given, Usually by Psychiatrist	102	
Definitely Psychotic or Suicidal (Institutional care Imminent)	9	
A. Number psychiatric cases listed as primary, secondary or complicating diagnosis	111	
B. Metabolic and Endocrine	69	
C. Cases not previously listed in "diagnosed" group showing definite psychosomatic findings on study, including coronary, peripheral vascular, essential hypertension, pylorospasm, peptic ulcer, asthma, metabolic, miscellaneous, etc. (Summarized in charts)	53	
Showing Positive Psychosomatic Findings	233	(Approx. 78% excl. of purely Neuro & Neuro-Surg.)

secondary or complicating one, the symptomatology, the course of illness and the clinical findings seemed to establish clearly that the difficulties were largely psychological.

There were 69 cases listed in the metabolic and endocrinological categories. The majority of these cases were disturbances of the thyroid, ranging from myxedema to toxic goitre. These were not included in the psychiatric group, although their symptoms were nervous, and involved disturbances in the vegetative nervous system. Unless there was a clear-cut psychogenic element in the case which had been included in the history, or made as an observation by one of the consultants, such cases were not included in the psychiatric group, although obviously the psychogenic elements must have played a considerable part.

Included were 53 organic cases, not listed in the psychiatric group, either in the primary, complicating or secondary diagnosis, but which had such obviously functional psychogenic elements described either in the history, or as part of the clinical examination that they could not fail to have some definite bearing on the psychosomatic side. These included the coronary, peripheral vascular, essential hypertension, pylorospasm, peptic ulcer, asthma, metabolic, urticaria, and other miscellaneous cases. Thus, there were a total of 233 cases which showed specific psychosomatic findings. This represented 78 per cent of the total series studied, and definitely excluded those cases which were purely neurological or neurosurgical, which did not show any disturbance of the psychic functioning. These included organic disease of the nervous system, such as multiple sclerosis, brain tumor, meningitis, degenerative diseases of the nervous system, etc. It might be argued that even in this group of cases there might be some relatedness to the psychosomatic side, since the soma itself was the nervous system. However, unless there was specific evidence to the contrary, such cases were not included. The 53 cases not previously listed in the "diagnosed" group showing definite psychosomatic findings, have been tabulated and included in the following charts: ·

The results clearly shown in this study make it paramount that a newer approach be utilized to offer the best therapeutic opportunity. It is obvious that most errors in diagnosis and treatment have a background in the history. According to Dr. Dunbar, this is inevitable because both the focus of the history and the method of history-taking precluded any adequate evaluation of psychic and somatic aspects of illness, even in terms of a general therapeutic program. The usual medical history and the usual psychiatric history belong to the "either-or" stage of medical practice. They are essentially inadequate for the ready evaluation of the psychic or somatic components in illness which should be the basis of any therapeutic program.

Since the patient and his physician's consciousness are focussed on somatic abnormality, when cases show no organic pathology, or cannot be understood etiologically in terms of the reaction of tissues to injury, it is felt that a concept of a pathogenic environment should be considered, which is expanded to include elements in the economic and social status which might be traumatic. Thus, it can be considered that over-protective mothers and neurotic school teachers can be added

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ESSENTIAL OR PRIMARY HYPERTENSION WITH OBSERVATIONS SHOWING PSYCHOGENIC ELEMENTS

1. "Headaches all her life." Single, unmarried, schoolteacher, active exaggerated maternal interest in pupils.
2. Peripheral vasospasm and psychomotor imbalance.
3. Very nervous insomnia. "B. P. over 200 for years." Always worried.
4. Marital discord outstanding. Marked anxiety.
5. Uncooperative, "high strung," irritable, BMR plus 21%. "Nervous symptoms marked."
6. Had ulcerative colitis—diarrhea for 11 years.
7. Nervous instability—hypochondria.
8. Globus hystericus—history of "nervous breakdown."
9. "Nervous vomiting" for years. Chr. headaches.
10. "Spasms" when patient worries about self, phobic.
11. "Nervous diarrhea for years." Hysterical blindness.
12. Always nervous and "high strung."

(3) Cases with primary diagnoses of peripheral neuritis gave definite history of previous "nervous breakdown."

15 Cases Showing Psychosomatic Findings Not Previously Classified as Such.

DISTURBANCES OF VEGETATIVE NERVOUS SYSTEM AND PSYCHOSOMATIC OBSERVATIONS EXCLUDING THYROID DISTURBANCE ALREADY LISTED

	Primary Diag.	
16.	Thrombo-angiitis Oblit.	Spastic colitis. Diarrhea with excitement.
17.	Chronic Appendicitis	Pylorospasm. BMR plus 16%.
18.	Abdominal Adhesions	BMR minus 16%. Hypochondriasis.
19.	Endometritis	Incontinent with emotional excitement. BMR minus 16%.
20.	Asthma	Gastric hyperacidity. Nervousness.
21.	Asthma	Very nervous—achylia gastrica.
22.	Chronic Sinusitis	Very nervous and emotionally unstable.
23.	Intestinal Adhesions	Emotionally disturbed, needs psychotherapy.
24.	Urticaria	Marked introversion.
25.	Pernicious Anaemia	Very nervous, psychoneurotic element, "neuritis" BMR minus 16%.
26.	Labyrinthitis	Psychoneurotic basis, very nervous, phobic.
27.	Chr. Tonsillitis	Nervous and phobic, hypochondriac.
28.	Subarachnoid Hemorrhage	Hallucinations, threw knife, psychosis.
29.	Cholecystitis	Period of "blindness" functional diarrhea.
30.	Chr. Prostatitis	Worried and melancholy.
31.	Fissure in ano	"Mental factors."
32.	Arthritis	"Anxiety neurosis."

CORONARY DISEASE CASES

33. Nervous, anxious, worried. Emotional symptoms antedating coronary disease.
34. "Nervous breakdown" following death of husband, always in poor health.
35. Depressed, suicidal, marital history involved, secondary glaucoma.
36. Pelvic inflammation. Severe functional disorder, antedating coronary disease.
37. Spastic colon. Severe functional disorder earlier.
38. Chr. appendicitis. Apathetic, depressed, apprehensive.

GOITRE AND DISTURBANCE OF THYROID EXCLUSIVE OF "DIAGNOSED" THYROIDISM IN WHICH NO MENTION MADE OF PSYCHIC FACTORS

39. Schizoid personality. Nervous, apprehensive all his life.
40. "Noises in head" for three years before goitre. Pelvic operation before symptoms of goitre developed.
41. Loss of job started symptoms.

DUODENAL ULCERS AND PYLOROSPASM

42. Severe nervous "breakdown," unstable, "weakness," insomnia. Son ran away from home and symptoms developed.
    Quest. cirrhosis of liver due to chronic alcoholism.
43. Twelve years ago had "nervous breakdown."
44. Goitre—nervous, irregular menses.
45. Five months ago after accident, patient became apprehensive.
46. Dizzy and nervous before onset of ulcer symptoms.
47. "Mind feels like constant hangover."
48. Unemployed, worried and anxious.
49. Absent-minded, irritable, emotionally upset.
50. "Nervous breakdown" in 1927, "stomach trouble" for 12 years.
51. Alcoholic for years.
52. "Financial problem." Pain in abdomen disappeared when these problems were settled.
53. Multiple complaints—hypochondria.

to gonococci and toxic factors in the physician's accounting of potentially injurious agents. The defect in both medical and social histories is the tendency to focus on symptoms, without an adequate impression of the personality which is reacting either to the over-protective mother, or to the gonococci. The purely psychiatric history is cumbersome, and was developed to register pathological processes occurring in personalities living in, or about to enter into what might be called an unreal world. However, such patients are quickly dismissed from general hospitals. The psychosomatic history is focussed primarily on the detection of emotional conflicts and their expression through disturbed organic functioning. It should be concerned, not only with conscious worries, but unconscious conflicts that produce somatic symptoms. Although unconscious conflicts are fundamental in psychic symptomatology, their somatic representation may be revealed with difficulty. These symptoms may constitute a powerful defense against their emotional background, precluding any awareness of it by the patient. Their etiology and meaning can be discovered only after a picture of the fundamental personality structure has been

obtained. Only in this way can confusions be avoided that often result from shifts in psychic to somatic manifestation, and vice versa. The focal problems, then, are the relationships to the symptom-formation on the one hand of character, and the other of somatic make-up, including constitution, physiological reaction types, etc. There also can be distortions in medical, social, and psychic histories in terms of the characteristic focus of each. Even in patients who have been studied from all points of view, one is apt to get the impression after reading the three histories that the patient himself has fallen in between.

The psychosomatic history must cover a few questions that go beyond the medical and social history. This is true particularly if the personal data do not go beyond recording the physical status, exercise, habits and possible addiction to tobacco, tea, coffee, or alcohol. The material obtained is evaluated differently. The first essential is delineation of the personality as a whole; hereditary, constitutional, and physical status reaction patterns, both physiologically and psychologically. It is well to obtain pictures taken from several different angles, i.e., pictures of the patient's habitual reaction in the various spheres where life demands adjustment, and then to superimpose them. This is merely the extension of the principle essential to the psychosomatic approach, of obtaining a stereoscopic picture of disease.

Extremely important is the fact that although the physician may be successful in obtaining an impression of the patient's preparation for illness, this is not sufficient, for not only conscious worries are most directly related to somatic symptomatology. Conscious worries are most likely to find expression by way of somatic short-circuit through conflicts of which the patient himself is unaware. Clues also must be obtained concerning difficulties about which the patient cannot tell the physician, somewhat as one may obtain clues by abdominal palpation concerning organic function of which the patient is unaware. The patient may feel that some symptoms are not important enough to tell the physician; often he has not observed such symptoms, or has forgotten points of fundamental diagnostic importance. In addition, he is likely to have conscious or unconscious reasons for wanting to omit or forget certain things. On the other hand, he may give the answers the physician hopes for, or those which he may think will make him stand well in the physician's eyes. Hence, the fewer direct questions and the more spontaneous the patient's story, the better, both from the standpoint of content, and from the point of view of the opportunity to observe habitual reaction patterns.

It is to be remembered that Sherrington wrote, "Pain is the psychical adjunct of a protective reflex." In addition, the patient's "will to get well," and its reverse should be studied. This is revealed in the attitude toward the hospital, toward present and past illnesses, towards invalidism, in the reaction of physiological changes present, the effect of illness on his life, and the importance of "illness gain," such as compensation. Patients who are most recalcitrant to treatment, and have paradoxical reactions to drugs, are often those whose symptoms serve a specific psychological purpose. Many symptoms serve a concrete purpose, and their significance can be evaluated only in terms of the total personality structure.

Every physician should learn to evaluate his own personality and the reaction he is likely to produce in patients by contact with himself. If a patient reacts in an exaggerated way, it may be that the physician reminds him of some one individual, or some experience of emotional importance in his life. This rapport with the physician is called transference, which is the sum total of the irrational or feeling elements in the patient's attitude toward the physician, as a sort of mirror-image of all his previous similar relationships. It is only in recent years that a sufficiently exact instrument for psychological observation has been developed to make possible studies of just what specific emotional tensions are related to specific physiological symptoms. Pasteur discovered the general relationship of bacteria to disease. Then came the investigation of the relationship of specific bacteria to specific diseases. Psychosomatic medicine is just entering the stage of searching for such specific correlations. Space does not permit presentation of many of the different types of psychosomatic illness having a specific correlation. However, numerous cases have

been reported in medical literature, largely as a result of research studies made at the Chicago Institute for Psychoanalysis. Their research shows that certain stomach and bowel disturbances including recurrent stomach pains, ulcers, constipation, colitis and diarrhea have specific emotional tensions, appearing to be the chief cause of the disturbance of function. These patients showed specific personality trends. Behind many of these individuals who showed an intense desire for independence and exhibited competitive and aggressive tendencies, is the little boy's craving for maternal love and care. It should not seem strange that frustrated longing for dependence, solace, and love can cause stomach disturbances which, if they had persisted over the years, could lead to ulcers. The longing for maternal love is a deep biological force.

In selected cases of essential hypertension and other cardiovascular disorders, such as extra-systoles, it has been shown that repressed anger and hostility seem to be the chief impulses involved. This bears out popular knowledge in the statement: "Don't get your blood pressure up" in cautioning against getting angry. The great anatomist, John Hunter, who suffered from angina pectoris once said, "My life is at the mercy of any rascal who can make me angry." The individual with essential hypertension can be caught in an emotional conflict which he can neither solve nor escape, and is left in a constant rage.

According to Saul and co-workers at the Institute for Psychoanalysis in Chicago, another condition which has been studied for specific emotional factors involved, is asthma. The importance of pollens in its causation is fully established, but it is also observed that in certain cases attacks were precipitated by emotional upsets just as in the gastric cases described. A wish for love was found to play a role in these also, but in asthma it is a somewhat different kind of love—not so much for support, indulgence and being fed, as for the closeness and protectiveness of the mother. Moreover, it was just when this relationship was threatened that attacks occurred in a series of cases studied psychologically, and thoroughly worked up by allergists. The asthmatic attacks occurred consistently just when the person felt threatened with separation or estrangement from his mother or mother-substitute.

Studies by Benedek and Rubenstein have shown the possibility of reciprocal interrelationships between emotions and organic symptoms. They showed that there can be not only the effect of emotional tensions upon the physiological, but also conversely the effect of certain relatively automatic physiological changes upon the emotional state. By a simple method, it has become possible to determine the amount of secretion of certain ovarian hormones during the course of the menstrual cycle in women. This was done in a series of cases where daily findings were compared with the patient's concurrent daily psychological state. In a normal cycle, to oversimplify the state of affairs somewhat, there is a gradual increase of the estrogenic hormones (estrogen) for the week or two following menstruation. When ovulation occurs, another hormone, progesterone, appears. During the increase of the first hormone, estrogen, from the end of menstruation up to the time of ovulation, it was found that the psychological material concerned itself increasingly with interest in men; with husbands, or fiance, or whoever had the attention of the particular patient. After ovulation, the material concerned itself less with the love object, more with pregnancy, children, and maternal interests. It was found, also, that not only did the hormone affect the emotional state, but the emotional state affected the hormonal secretion. For example, if expectations of love are heightened and then frustrated, the hormonal level usually falls.

Summary

The general physician has been seriously handicapped by lack of adequate means to estimate the psychic components of illness with which he is dealing. The psychiatric examination itself is inadequate, clumsy, and time consuming. It is just as unsuitable for office use as were many procedures for blood analysis when first discovered. The psychosomatic approach permits a focus and scope of history and examination which gains a deeper understanding of the patient's illness. Such a method—using careful questioning and comparison of patient's statements with those recorded in medical and social history, and by observation of the meaning of shifting

tensions, exacerbation of his illness, of his reactions to the physician and to hospitalization, is of great significance.

A study of the emotional tensions indicate that they are controlled basically by the biological forces which constitute man's nature. There is no sharp line between the normal, the neurotic, the psychotic, and the criminal. The difference is only one of degree. Usually in these pathological conditions, the organism is not damaged, and the physical and mental mechanisms are not differently constructed or motivated by different kinds of forces than in the normal. The great variations are functional in nature. The merest beginning has been made to work out the answer. The obligation falls upon the physician to become aware of the importance of this problem, and to find a solution which is so necessary, if we are to completely fulfill our responsibilities as physicians.

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Tuberculosis in Drug Addicts*

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The treatment of pulmonary tuberculosis remains a major concern of the medical profession. One hundred thousand beds are maintained in this country for the care and treatment of pulmonary tuberculosis. The expert treatment thus provided for the individual victims of this disease saves also the lives of thousands who never enter sanatoria. At no time has the number of available beds represented more than perhaps 10 per cent of the number of existing cases capable of communicating the disease. The partial isolation, however, of small groups has been a potent factor during the last 25 years in reducing the mortality rate because it has reached the infection rate.

Certain cases of pulmonary tuberculosis become drug addicts and certain addicts become tuberculous. On May 1, 1941, there were 664 drug addicts hospitalized in the United States Public Health Service Hospital at Fort Worth, Texas. Of these, 30 patients, or 4.5 per cent of the total institution population, average age of 39.1 years[1] had active pulmonary tuberculosis. This incidence is compared with published data[2,3] on other groups in Table I.

TABLE I
INCIDENCE OF PULMONARY TUBERCULOSIS IN CERTAIN GROUPS

Source of Study	*No. of Cases Examined*	*Average Age*	*Active Cases Found per 100*
U. S. P. H. S. Hospital (May 1, 1941)	664	39.1	4.5
N. Y. Health Dept. (H. R. Edwards)	133,062	30.2	2.5
National Youth Administration Enrollees	8,708	20.8	0.9
Mental Hosp. Patients (C. A. Wicks)	13,000	43.0	1.3
Riker's Island Prisoners	3,892	38.5	4.5
House of Detention Prisoners	1,023	31.5	1.0
Homeless and Transient Men	4,716	50.5	5.3

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Sixteen per cent of our cases of tuberculosis had a unilateral type of chest lesion, suitable for pneumothorax therapy. Nine per cent had a unilateral type of tuberculosis, either too far advanced or with multiple adhesions, rendering the case unsuitable for induced collapse with pneumothorax. Eleven per cent had a bilateral apical tuberculosis. Sixteen per cent were of the bilateral fibrous, non-exudative type of tuberculosis; and forty-eight per cent had a bilateral proliferative and exudative type of lesion. This extent of far-advanced cases is greater than is encountered in non-addict centers. The physical, dietary, and social neglect so commonly encountered in the chronic drug user, probably accounts in a large measure for the advanced clinical picture. The respiratory depressant effect of morphine, and its tonic action on the smooth muscle in the walls of the bronchi cannot be dismissed as possible etiologic factors.

The diagnostic procedures employed in the case finding program at this hospital are the usual ones of physical examination and roentgenological study, plus clinical observations. These latter include certified sputum examinations, gastric analysis studies for acid-fast bacilli, Schilling response to tuberculin, Wintrobe method of sedimentation rate, and the Weltmann serum coagulation test.[4] Following the injection of a small amount of tuberculin, there is an increase in the immature white cells and a diminution in the mature granular cells. This very characteristic Schilling response to tuberculin is usually seen thirty-six hours after the intracutaneous test and forty-eight hours after the patch tuberculin test. A similar response is not seen in non-active tuberculosis patients. The Weltmann serum coagulation test,[4] which is rather simply executed, gives an indication not only of the chest activity, but also a clue as to whether the pathological picture is one of inflammation, exudation, proliferation, or regression.

Routine treatment at this hospital includes all generally accepted procedures with two exceptions: (a) Opiates are used only when indications are clear, and then only in minimally effective doses; (b) moccasin venom is used for hemoptysis.

Morphine, because of its great addiction producing liability, is definitely contra-indicated as a cough controlling medicine. A few cases of pulmonary tuberculosis enter the hospital actively addicted to morphine. All of these improve when taken off morphine. Codeine is very effective in controlling cough. It has less addiction liability than morphine but cases of codeine addiction have been reported. Because of this one should not administer doses that are larger than necessary. Davenport's findings,[5] that a dosage of 10 milligrams (gr. 1/6) administered up to four times a day is adequate, have been confirmed by us. Pharmacological sedation is used by us only when that much more wholesome measure of physiological rest proves inadequate. Morphine is used only in the terminal stages and then only for purposes of making the exodus as comfortable as possible. At the moment, no cases are on morphine and no cases are receiving codeine.

The use of moccasin venom represents a new procedure in the control of hemoptysis. It was introduced by Peck in 1932[6] for the treatment of conditions characterized by a tendency to hemorrhage. This followed the experimental work of Peck and Sobotka,[7] who outlined the use of moccasin venom in such cases as idiopathic nasal bleeding, functional uterine bleeding, Osler's disease, and even thrombocytopenic purpura. A number of workers both at this hospital and at the United States Public Health Service Hospital in Lexington, Kentucky, were stimulated to use this drug in the treatment of hemoptysis in pulmonary tuberculosis. Our experience covers a period of four years and the results have been excellent. The procedure followed is exactly as outlined in the circular which accompanies each ampule of the medication. It is simple to use and sensitizations are seldom encountered. We never use morphine for hemoptysis because moccasin venom works more rapidly and more effectively.

All other therapeutic measures are quite orthodox in type. They include adequate bed rest, good nutrition, high vitamin and calcium therapy, pneumothorax, and other surgical procedures that are indicated. General psychiatric management, including occupational therapy on the ward and formal psychotherapy in carefully selected cases, have yielded encouraging results. The total program outlined above has been worked out step by step during the past several years and the experience on the whole has been quite gratifying.

It is in complete accord with our concept that the use of opiates in the treatment of pulmonary tuberculosis is in most instances unnecessary.

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Alcohol and Traffic Accidents*

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Forty years ago, if a person had imbibed a little too freely at a Saturday night party, he had little difficulty in getting home safely. All he had to do was climb into his buggy or have his friends load him in, and trusty Dobbin took him there safely. If he fell asleep on the way, it made little difference.

Today, it is a different story. High powered automobiles have replaced the horse and buggy as a means of transportation. There is no trusty Dobbin to take over the reins when the driver's attention wanders from the road because of the influence of alcohol.

At the present time, there are more than 32,000,000 automobiles in the United States, which is 65 times the number which we had in 1910. In addition, their speed and their consequent destructive power have increased greatly since that time. Drivers of modern automobiles must face very complex traffic situations, demanding accurate judgment and quick action. It is imperative that they maintain complete control of their normal faculties when on streets and highways.

Traffic Accident Problem

During 1941, 40,000 persons were killed in traffic accidents in the United States, an all-time high death figure. The 1941 death toll approached the U. S. death toll exacted by World War I—50,510 soldiers, sailors, and marines killed in action or died of wounds.

In addition to the deaths, more than a million persons are injured annually in traffic accidents. Taking into consideration wage losses, medical expense, overhead costs of insurance, and property damage in accidents, the annual economic loss due to accidents amounts to well over a billion and a half dollars, an amount almost sufficient to defray the entire annual cost of the public school system of the United States.

Alcohol as a Factor

Alcohol is an important primary cause of many traffic accidents. However, it is difficult to say exactly how many of them are due to alcohol, because most accidents have a combination of several causes, and because few accidents are investigated carefully enough to determine exactly to what extent each circumstance contributed to the accidents.

Official Summaries—Most of the available accident statistics are obtained from the routine monthly and annual summaries of information on the official accident reports.

*Presented at the Symposium on Alcoholism of the Research Council on Problems of Alcohol, at Annual Meeting, American Association for the Advancement of Science, Philadelphia, December 29, 1940. (Data and statistics corrected to include 1941).

These reports are made by drivers involved in the accidents and by police officers who investigate them. Naturally, among the 48 states, there is a great deal of variation in the systems used for reporting the accidents and summarizing them. This is reflected in the variations in the reported frequency of drinking violations on the part of drivers and pedestrians involved.

In 1939, 11 per cent of the drivers and 15 per cent of the pedestrians involved in fatal accidents were reported as having been drinking or intoxicated. These are averages of percentages from the annual reports for 35 states.[1] However, the percentages for drivers varied from as low as 0.0 per cent to as high as 24.9 per cent, and for pedestrians, the variation was from 0.0 to 30.0 per cent![2]

Although much of the variation in reported figures is due to variation in completeness of reported information, state officials agree that a great deal of the variation is the result of differences in methods used by different states in reporting drinking as a factor in accidents. For example, some states report frequency of drinking violations in terms of per cent of *drivers,* while in others, it is a percentage of *accidents.* In addition, some states report only those who appear obviously intoxicated or drunk, while in other states, the classification is made on the basis of whether or not the person had been drinking.

Several committees have been working to standardize and to improve methods for reporting and summarizing traffic accident information. Standard forms have been developed and are now in use by many states.

These standard forms contain schedules on conditions of drivers and pedestrians which have been designed to show the various stages of driver and pedestrian intoxication and also to provide a classification for those whose impairment was indeterminate.

Figures 1 shows this classification for drivers,[2] with figures representing the experience of 8 states in 1939.

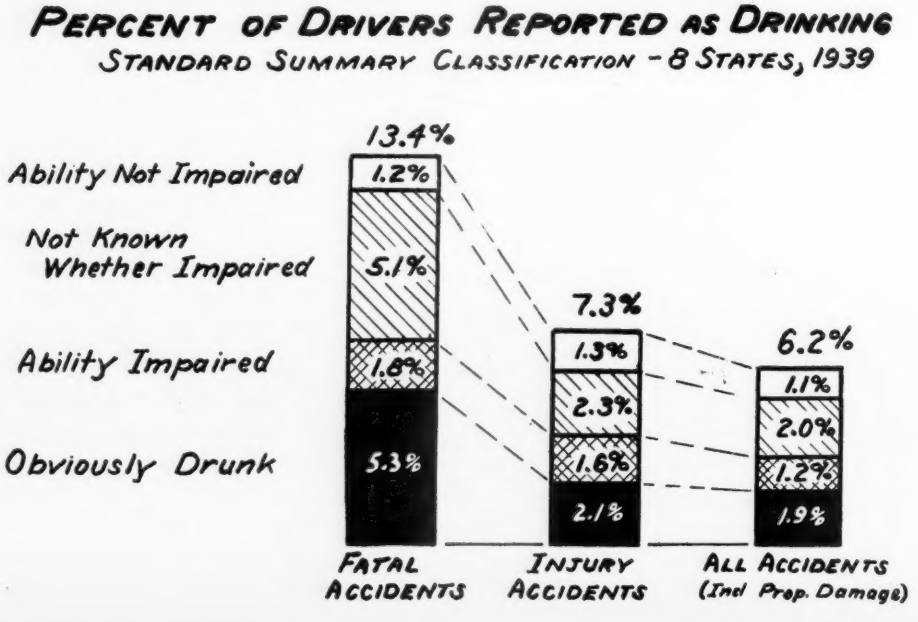
This figure shows that drinking is reported more frequently for fatal than for non-fatal injury accidents. It shows also that an appreciable group of those reported as had-been-drinking are included in the "not known whether impaired" classification.

As more states adopt a standard report form and summary form, it will be expected that better information will be available for the entire country.

Special Studies—Special studies of information on accident reports have produced data which are not available on the usual monthly and annual summaries prepared by state departments. This information is summarized briefly as follows:[2]

1) The frequency of reported drinking on the part of drivers and pedestrians is much higher at night and over week-ends. Between 80 and 90 per cent of the accidents involving

FIGURE 1



such reported drinking occur at night. About one in every three fatal accidents at night involved reported drinking on the part of drivers or pedestrians.

2) A collision between two or more vehicles is the predominant type of accident involving a drinking or intoxicated driver. In such accidents, the drinking driver usually is guilty of a driving error while the non-drinking driver is rarely at fault, indicating that alcohol is an important primary factor contributing to the accident.

3) Drinking on the part of drivers and pedestrians is reported somewhat more frequently for accidents occurring in rural areas than for those occurring in urban areas.

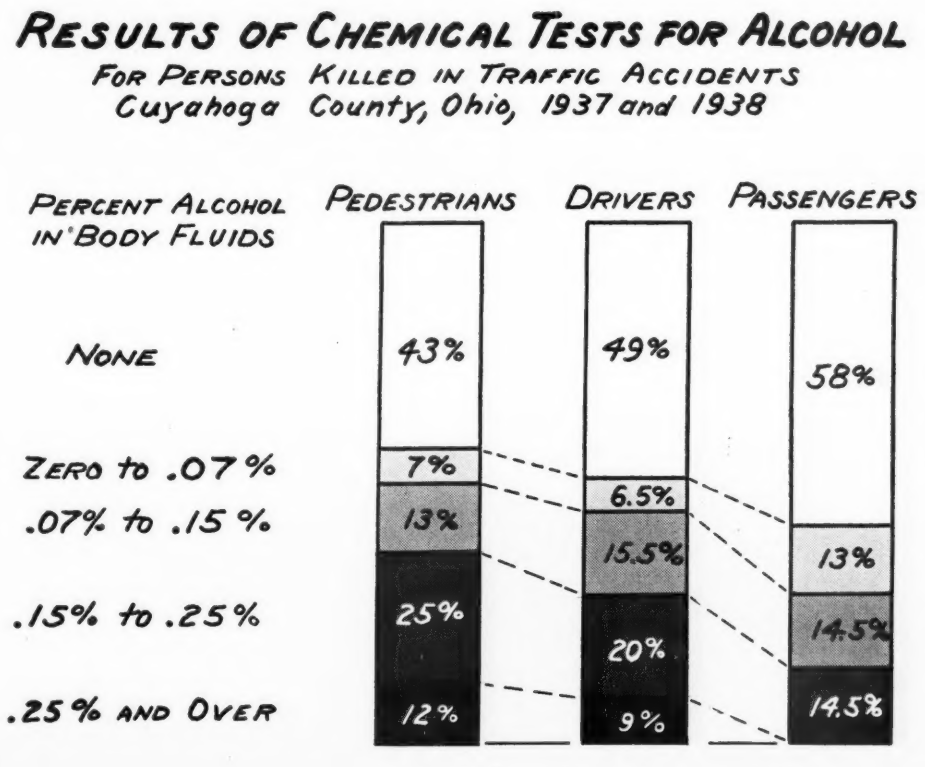
Chemical Test Surveys—The information from the official accident reports is only an indication of the true situation, since the determination of whether or not drivers and pedestrians were drinking or were under the influence of alcohol is based entirely upon the opinions of those making out the reports. Comparatively few localities make use of chemical tests to determine the concentration of alcohol in body fluids or breath of persons involved in accidents.

Special surveys involving chemical tests of body fluids or breath of drivers and pedestrians injured or killed in accidents indicate that summaries of official reports understate the true situation. Three special studies of drivers involved in injury and fatal accidents were made in Evanston, Ill., Uniontown, Pa., and Cleveland, Ohio. The per cent of the drivers found with some alcohol in the blood varied from 38 per cent in the Evanston study to 56 per cent in the Cleveland study. Studies in Cuyahoga County, Ohio, (Cleveland area) are revealed in Figure 2.

Concentrations of alcohol in the blood in excess of 0.15 per cent have been recommended by Committees of the National Safety Council,[3] and of the American Medical Association[4] as definite evidence that the driver was under the influence of intoxicating liquor. The Evanston study shows that 12.5 per cent of the drivers were in this classification. For the Uniontown study, this figure was 31 per cent; for Cleveland, 29 per cent.

If it is assumed that half of those in the blood alcohol group of .07 to .15 per cent were also impaired to some extent, the average for the three studies indicates that at least a third of the drivers had sufficient alcohol in their systems to impair the ability of the

FIGURE 2



average person to drive properly.

Chemical test surveys of pedestrians injured or killed have also been made in at least two instances,[5] and reveal even higher percentages applying to pedestrians injured or killed in accidents.

Evanston Study—A special study[6] made in Evanston, Illinois, has revealed some very significant information. This study not only involved alcohol tests of drivers injured in accidents, but also involved chemical tests of the breath of a large number of drivers stopped as they were driving along the streets of Evanston. The non-accident drivers served as a control group. Thus, it was possible to make comparisons between the percentages of accident and of non-accident drivers in each of several ranges of blood alcohol concentration.

The relative chance of an accident for drivers with different blood alcohol concentrations was approximated, assuming the relative accident chance with no alcohol as 1.0. The results, shown in Figure 3, indicate that the average person with a concentration of alcohol in the blood of .15 per cent or more is *55 times more likely* to have a personal injury accident than is a driver with no alcohol.

Present Situation in Dealing With Problem

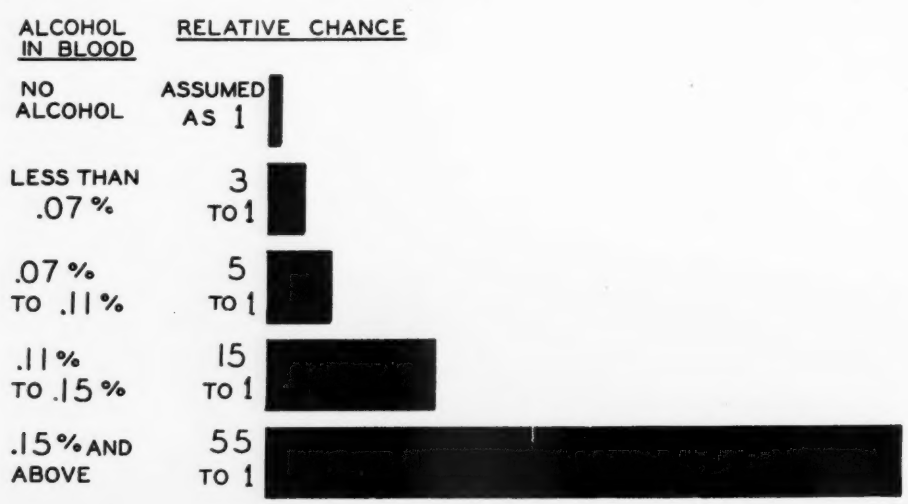
Legislation—The foregoing statistical information has shown the need for doing something about the drinking driver problem. Every state has recognized this need, and has adopted laws making it a criminal offense to operate a motor vehicle while intoxicated or under the influence of liquor. Penalties following convictions for such offenses consist of fines, imprisonment, revocation of driver's license, and in a few states, the impounding of the vehicle. The minimum penalty for the first offense in about half the states is a $100.00 fine or 30 days in jail, with a one-year suspension of the driver's license. For the second offense, many states have a mandatory minimum prison sentence of three months.

The law in 42 states[7] makes it a criminal offense to drive while under the influence of intoxicating liquor, while in the remaining 6 states, it is unlawful to drive while in an intoxicated condition. Courts of many states[8] have held that there is a difference between "under the influence" and "intoxicated."

The Supreme Court of Arizona[9] has defined "under the influence" as follows:

"The expression 'under the influence of intoxicating liquor' covers not only all the well-known and easily recognized conditions and degrees of intoxication, but any abnormal mental or physical condition which is the result of induling in any degree in intoxicating liquors, and which tends to deprive them of that clearness of intellect and control of himself which he would otherwise possess. If the ability of the driver of an automobile has been lessened in the slightest degree by the use of intoxicating liquors, then the driver is deemed to be under the influence of intoxicating liquor. The mere fact that the driver has taken a drink does not place him under the ban of the statute unless such drink

FIGURE 3



has some influence upon him, lessening in some degree his ability to handle said automobile."

Thus, a person in the "under the influence" class is not necessarily in the more advanced stage where he is also "intoxicated" or "drunk" as used in hospital classification. He may be able to pull himself together sufficiently for a short time to perform habitual actions and such tests as walking a straight line and touching his finger to his nose. However, when faced with unexpected situations demanding judgment and quick action, his ability is definitely impaired, and he is unsafe when behind the wheel of an automobile.

Difficulties in Getting Convictions—The police and the prosecutors are faced with many difficulties in getting convictions for driving while under the influence of intoxicating liquor. The penalties for the offense are rather severe and juries properly hesitate to return a verdict of "guilty" unless they are sure beyond reasonable doubt that the person really is guilty.

The difficulty in many cases is due to the fact that the only available proofs of the person's condition are the opinions of witnesses and the observations of police officers. In the average jury trial, three or four witnesses for the state (usually officers) testify that at the time of the accident they saw the defendant, observed his condition, witnessed him perform certain actions, and as a result, it was their opinion that the defendant was under the influence of intoxicating liquor. The defense also has several witnesses, who testify that the person had only a "couple of beers," and that they saw the defendant shortly before the accident, and that he was not under the influence. The jury is then instructed that they must be satisfied beyond a reasonable doubt. Confronted with this conflicting "opinion" testimony, the jury usually returns a verdict of "not guilty."

In many cases, the defense successfully raises doubts as to whether the abnormalities were the result of intoxicating liquor. Defense attorneys point out that an injury in the accident *might* have accounted for the abnormal actions. The taking of medicine *might* be responsible for the odor of alcoholic liquor on the breath. Faulty steering gear *might* have been responsible for inaccurate driving prior to the accident. The taking of insulin, use of a mouth wash, and lack of sleep are among standard alibis.

Many of these possible false defenses can be refuted successfully if the officers carefully question the suspected person before time is given to develop the alibis. This type of examination should always be given, regardless of whether it is supplemented by chemical tests.

In many cases of suspected driving while under the influence, police officers call in physicians for physical examinations. Even in these instances, there are many difficulties. Physicians hesitate to pronounce a man as intoxicated or under the influence unless they are sure. Even then, they may hesitate, since they know that the defense attorney may have another physician testifying that the person was not under the influence. Many physicians will not handle such cases because of the possible detrimental effect upon their private practice.

Chemical Tests—To avoid such "disagreements of experts," committees of the American Medical Association and of the National Safety Council have recommended[3,4] that chemical tests of body fluids or breath he used in all cases as an aid in diagnosing alcoholic influence of drivers. These tests will confirm objective symptoms by showing definitely whether there is a sufficient concentration of alcohol in the blood to cause the person to be under the influence of alcohol.

Methods for making chemical tests, and possible variations to be expected in tolerance to alcohol, will not be treated here. It is known, however, that there is a fairly definite relationship between the concentration of alcohol in a person's blood and the degree of intoxication. This has been recognized not only by committees of the American Medical Association and of the National Safety Council, but also by the legislatures of the States of Indiana[10] and Maine,[11] and more recently by New York and Oregon, which have adopted laws officially setting forth a definition of "under the influence" in terms of blood alcohol concentrations.

The committees' recommendations and the new state laws provide for two blood alcohol values or limits, rather than selecting one arbitrary dividing line for distinguishing between those under the influence and those not in that classification. These values are

.15 per cent blood alcohol and .05 per cent, the second being just one-third the first. Drinking drivers thus are divided into three classifications: (1) blood alcohol from zero to .05 per cent; (2) blood alcohol from .05 per cent to .15 per cent; and (3) blood alcohol of .15 per cent and above. These are shown in Figure 4.

In the range below .05 per cent blood alcohol, practically no person would be sufficiently under the influence to be an unsafe driver, and no driver should be prosecuted for being under the influence of alcohol. The use of alcohol tests thus would permit the non-drinker and the mild drinker to avoid embarrassment of an unjust arrest.

In the blood alcohol range between .05 and .15 per cent, some people would be definitely under the influence.[3,4] The percentage of people affected would be greater at the higher concentrations of alcohol. This evidence should be used only when other symptoms warrant prosecution.

In the range above .15 per cent blood alcohol, every driver is definitely influenced by his accumulated alcohol.[3,4] The state laws of Indiana, Maine, New York and Oregon provide that such concentrations are prima facie evidence of the driver being under the influence of alcohol. This presumption puts the burden of proof on the defense to show that the subject was not under the influence. The defense has an opportunity to refute the evidence by showing that the subject has a tissue tolerance sufficient to withstand the effect of a concentration above .15 per cent blood alcohol. However, this would be extremely difficult, as has been pointed out by Bogen.[12]

Some investigators feel that this upper limit should be .10 per cent rather than .15 per cent, since there are few, if any, drivers with concentrations above .10 per cent who do not show impairment in special tests. Possibly the .15 per cent limit may be lowered to .10 per cent as chemical tests become more widely

FIGURE 4

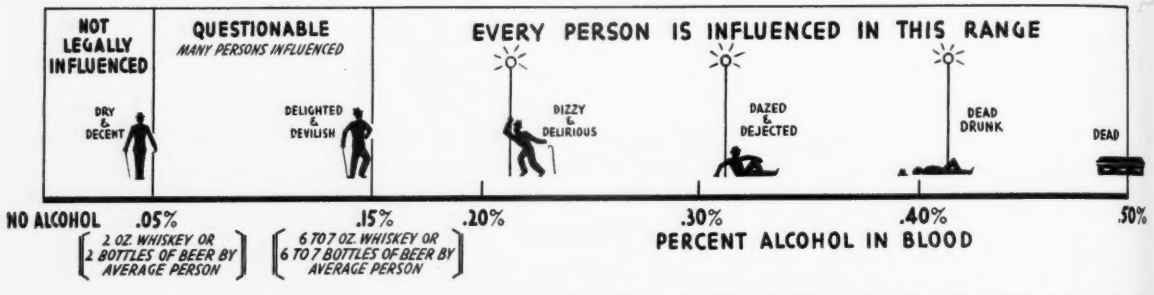
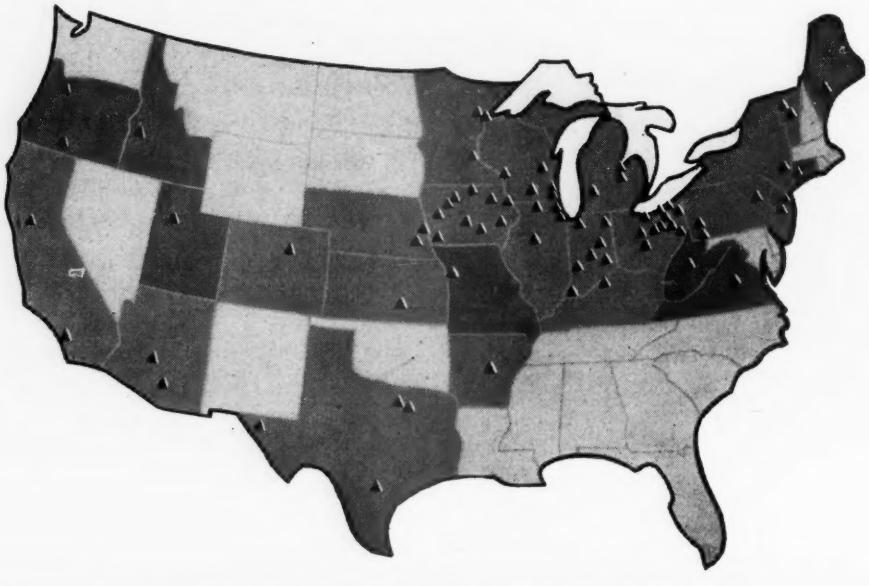


FIGURE 5



Locations where chemical tests are in use.

accepted and more evidence becomes available on tolerance to alcohol.

Use of Chemical Tests—Chemical tests have been used successfully in many places throughout the country. Recent information indicates that they have been used in at least 27 states,[5] as shown on the United States map in Figure 5.

Several state police systems, including those in Indiana, Vermont, Iowa, Ohio and Minnesota, have definite arrangements providing for the use of chemical tests in different locations throughout the state.[4,13] In Indiana, the test equipment is located in every state police post, with trained technicians for performing the tests.[14]

Cleveland and Milwaukee are the two largest cities using chemical tests on a routine basis for enforcement purposes. In Cleveland, urine specimens are taken by the police officers, with analyses made by trained chemists in the police laboratory.[15] A physician attached to the laboratory handles the expert testimony. In Milwaukee,[13] the chemical tests are made in the City Health Department, with the health commissioners and Dr. H. A. Heise handling the expert testimony when it is needed. These tests are also used extensively in Kansas City.

Chemical tests have been a very effective aid to the police in dealing with suspected drivers. In Milwaukee, for comparable periods, convictions for driving while influenced more than doubled after the tests were started, while convictions for reckless driving decreased 40 per cent.[3] Similarly, there was a great improvement in the 1939 conviction records for cases handled by the Cleveland Police Department,[15] and by the Indiana State Police.[14]

The use of chemical tests also aids in exonerating innocent persons who actually may be suffering from a blow on the head or from some other injury in an accident.

Legal Problems—As the use of chemical tests for enforcement purposes becomes more widespread, legal problems are bound to arise. One important question is whether or not officers and physicians can compel persons to give specimens for the tests. No court of last resort has yet ruled specifically on this point, although there have been many rulings in analogous cases.[16,17,18] These refer to compulsory physical examinations, fingerprinting, blood grouping tests,[19] and similar cases.

An excellent summary of legal decisions on constitutional questions is given in a report by Dean Ladd and Dr. Gibson of the University of Iowa.[16] In that report, it is concluded that there should be no need for consent, since most constitutional prohibitions apply to word of utterance rather than to physical facts which, by their very nature, could not lead to a falsehood.

The Arizona Supreme Court in a test case has ruled that evidence from a urinalysis was admissible, even though the suspect did not know why he was asked to give a specimen.[20]

The extent of the force necessary to obtain a specimen is an important consideration. The Attorney General of Indiana recently has ruled[21] that the State Police can use reasonable force in requiring a person to submit to the Drunkometer breath test. (The only force required with this test is that needed to hold the person while a tube for collecting the breath specimen is held near his nose or by blowing up a balloon which is a simple matter. (See Figure 6). In getting urine specimens, some police have placed a suspected person in a cell which has a urinal with a false bottom.[3] The person is confined in the cell until he chooses to give a specimen. The subject is not forced to give the specimen.

FIGURE 6

A simple method of obtaining breath specimen.

Other legal problems in a program of chemical tests are positive identification of the specimens, and accuracy of the chemical tests. Those obtaining specimens should be carefully trained in the proper procedure for collecting the specimens, and for preserving and labeling them, so that there will be no question of positive identification. The meth-

ods for chemical analysis should be sufficiently accurate and care should be taken in their use so that those testifying in court will be able to say that the material identified was ethyl alcohol.[5] In questionable cases, the tests should be run in duplicate or with different specimens taken at different times. Special precautions are necessary when using urine as a test material, as was recently pointed out by Haggard.[22]

Planning the Program—Before starting to use chemical tests for enforcement purposes in a locality, the program should be planned very carefully. The organization of a local committee to investigate thoroughly all possible arrangements for making chemical tests is helpful in starting the program. This committee should be composed of interested officials, citizens and professional persons.

The forms to be used should be prepared and printed, and the chemists and police officers should be trained in their part of the program. The officers should be given special training in observing objective symptoms and in questioning the suspected drivers.* Chemists should perform a series of control tests so that they can be sure of their accuracy. Many specimens from suspected drivers and pedestrians should be taken and analyzed before the first case involving chemical tests is taken to court.

Before using chemical tests for enforcement purposes, a carefully planned educational program should be carried on for some time to stimulate interest and to obtain support from the judges, prosecutors, police officials and the public in the new program. Demonstrations, sound-slide films,** newspaper stories, speeches and radio should be used in this educational program.

After all arrangements have been made, the training completed, the experimental tests run, and the officials and the public sold on the value of chemical tests, the first case involving the tests can be taken to court.

Expert testimony may be needed in the first few contested cases. Later, it is likely that very few cases will be contested, since defense attorneys will urge their clients to plead "guilty" when the results of the tests and the objective symptoms show influence of alcohol.

How Science Can Aid—Scientific workers can aid in dealing with this problem in the following ways:

1) Make alcohol tests of persons injured or killed in traffic accidents, to aid in the study of alcohol as a factor in such accidents. Coroners, hospital authorities and others can cooperate by collecting this information.

2) Make additional studies of the relationship between blood alcohol concentrations and degree of intoxication as measured by careful performance tests. When publishing results of such studies, legal differences between "under the influence" and "intoxicated" should be recognized, because misstatements will be used by defense attorneys to cast doubt upon the reliability of chemical tests as an aid in diagnosing the degree of alcoholic concentration.

3) Cooperate with state and local enforcement officials by aiding in the training programs and assisting in the handling of technical problems involving use of such tests for enforcement purposes.

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*Instructions for examining suspected persons and for obtaining and identifying specimens are given in a mimeographed memorandum "How to Handle the Drinking Driver," National Safety Council.

**A sound-slide film "Testing the Drinking Driver" can be borrowed from the National Safety Council at no charge except for transportation costs.

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Book Review

PSYCHIATRY IN MEDICAL EDUCATION. By Franklin G. Ebaugh, M.D., and Charles A. Rymer, M.D., 1942. Commonwealth Fund, New York. 606 pages, 12 chapters, Appendix and Index.

This is an excellent survey of the pattern of instruction in psychiatry in the medical schools of the United States. The factual material is based upon a survey of 66 medical schools in the United States and Canada, made by Dr. Ebaugh in 1932 under the auspices of the Division of Psychiatric Education of the National Committee for Mental Hygiene. Other data and follow-up material has been obtained by questionnaire and the book presents a longitudinal picture of the growth and development of psychiatric education in the medical schools in the past decade. This development is outlined chonologically in Chapter I. Chapter II contains an unusually readable summary of psychobiology and may be recommended to both teachers and students. Chapter III is probably the best single section of the book and discusses the medical curriculum in general, the problem of premedical requirements and the selection of the medical student. This particular chapter is recommended reading for the administrative officials and curriculum committees of all medical schools. The plea for a type of medical education which will prepare the physician to care for his patients as living participants in a social system or culture, rather than as a bundle of scientific phenomenon is presented in a most convincing fashion. Chapter IV contains the data from the 1932 survey and gives a more detailed outline of the educational plan in the major schools of the United States. Chapters V to IX, inclusive, are devoted to a detailed discussion of manners of approach to the various phases of undergraduate psychiatric teaching in representative medical schools. The material is factual and should prove of benefit to teachers in planning a teaching program to utilize efficiently the time allotted in the curriculum. Chapter X presents data on graduate training in the principal training centers in the United States. This section should aid other institutions in outlining a plan of graduate training, and should prove of great value to the student or intern seeking a residency in psychiatry. Chapter XI discusses postgraduate training in terms of short intensive courses, and contains much first hand information based on the experience of the authors in conducting such courses. It also presents the plan of such courses in representative training centers in the United States. Chapter XII entitled "Retrospect and Prospect" contains an evaluation and a hope for the future in terms of the ideas, beliefs and thinking of the authors, and is one of the most enjoyable portions of the book.

The appendix contains a heterogeneous collection of questionnaires, examination outlines, personality studies and other implements of teaching referred to in previous sections.

This book is full of facts, and of figures, but manages to present in a very readable style a detailed account of psychiatric education as it exists today. As such it can be recommended as required reading for all persons concerned with any phase of medical education. As a source-book for information in this field, it is superlative. As a stimulus to thought and reorientation in the planning of medical education in general it is prophetic.

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